

EARLY PLEISTOCENE PLANTS FROM THE MIDDLE RIO GRANDE VALLEY OF NEW MEXICO

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ABSTRACT

Recent fossils from New Mexico are reviewed in the context of understanding the history of riparian (bosque) vegetation in the Middle Rio Grande Valley of New Mexico.

KEY WORDS: fossils, paleoecology, New Mexico, bosque, riparian

In recent years, the preservation of the New Mexico Rio Grande cottonwood forest (bosque) has become of prime concern to both biologists and the general public. Although the Rio Grande bosque is now universally accepted as an important resource, little is known about its origins and evolution. Even the recent history of the bosque is obscure. Photographic records and biological data pertaining to the Rio Grande in New Mexico did not appear until the early part of the twentieth century (Van Cleave 1935). Consequently, speculation on the origin and antiquity of the bosque has been quite varied and generally unsubstantiated by data.

Axelrod (1948) speculated that much of the modern southwestern vegetation may have developed by the Pliocene, about 5 million years ago. Axelrod & Bailey (1976) later speculated that ancestors of modern plant species in the rift valleys of New Mexico may extend back to the mid-Miocene. Meyers (1983) documented a number of Neogene fossil plants from New Mexico that bear similarities to modern floras. Although these reports provide insight and data into the potential origin of the New

Mexico rift valley flora, none of these reports documented evidence as to the actual antiquity and composition of the early Rio Grande bosque.

Recent fossil finds recovered from the Tijeras site located in Albuquerque, New Mexico at UTM Zone 13 Northing 3678150, Easting 351650, provide evidence of a well-developed Rio Grande bosque (Knight, Lucas & Cully 1996) by the early Pleistocene (Irvingtonian land-mammal "age", about 1.2-1.4 Mya). The fossil plants described here were deposited at the New Mexico Museum of Natural History (NMMNH) in Albuquerque, NM. The plant fossils of the Tijeras site represent the earliest indication of the modern Rio Grande cottonwood forest. An abundance of fossils of broad-leaf cottonwood and contemporary willow species at the site indicates that the early Pleistocene Rio Grande bosque forest may have been structurally similar to the contemporary bosque. The assemblage of species recovered from the Tijeras site suggests that the early Pleistocene floodplain of the Rio Grande was populated by stands of *Populus fremontii* S. Wats., and *Populus angustifolia* James ex Long (cottonwood), intermixed with *Prunus* (cherry) and *Celtis* (hackberry). Shrubby taxa, including *Rosa* (rose) and *Crataegus* (hawthorn), occurred within the forest. The canopy forest was interrupted by active river channels and static bodies of water. These channels and ponds were lined by several species of *Salix* (willow) including *Salix amygdaloides* Anders., *S. exigua-interior*, and *S. gooddingii* Ball. The edges of ponds supported stands of *Typha* (cattail). The higher portions of the floodplain likely supported *Quercus* (oak). Many of the genera represented in the Tijeras flora (*Prunus*, *Quercus*, *Rosa*, and *Crataegus*) do not occur in the current Rio Grande bosque, but have been displaced to adjacent drainages at higher elevations.

Although the composition of the flora from the Tijeras site suggests a slightly cooler and wetter environment than presently exists at that site, there can be no doubt about the similarity of the Tijeras paleoflora to the flora of the modern Rio Grande bosque. These findings document a well-developed early Pleistocene woodland in the Middle Rio Grande Valley. For centuries, New Mexico's Rio Grande bosque has been the center of the region's cultural development.

These new findings document that this woodland has been an important component of the ecology of the area for more than a million years.

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